

REMARKS

Entry of the foregoing, reexamination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. § 1.112, and in light of the remarks which follow, are respectfully requested.

Claims 48-51, 60, 68 and 70 have been amended at least partly in response to issues raised in the Office Action. Claims 39-76 remain pending in this application.

Turning to the Office Action, claims 48-51, 55, 60, 62, 68 and 70 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth in paragraphs (1), (2) and (3) on pages 2-3 of the Action. Reconsideration of this rejection is requested in view of the above amendments and for at least the following reasons.

Formula III in claim 60 has been corrected by the present amendment to obviate the rejection in paragraph (1) of the Action. Claim 70 has been rewritten in independent form to provide a definition of formula IV and to avoid variations between dependent claims in the definition of NX'X". Accordingly, the rejection in paragraph (2) of the Office Action has been obviated.

With regard to the rejection in paragraph (3) of the Office Action, Applicants respectfully disagree with the Examiner's position and maintain that the scope of the claims, when read in light of the disclosure, would be readily apparent to those of ordinary skill in the art. Clearly, the present invention requires the presence of a dimer containing uretidinedione groups and this should be readily apparent from reviewing the disclosure.

Claims 48-51 and 68 have been amended to clearly specify that the methods set forth therein produce compositions containing a mixture of (a) at least one trimer

containing an isocyanurate or a compound with a biuret unit or both, and (b) at least one dimer containing a uretidinedione unit. The term "low viscosity" is defined on page 19 of the specification and clearly refers to compositions containing said dimer. The term "(cyclo)condensation" has been removed or replaced by the term (cyclo)trimerization. A review of the instant specification would clearly indicate to those of ordinary skill that, while the main reaction is intended to produce trimers, small amounts of other oligomers usually are produced during the condensation. Note page 2, lines 1-6.

Cyclo(condensation) was intended to be used interchangeably with (cyclo)trimerization to encompass (cyclo)trimerization reactions which produce other oligomers.

For the above reasons, the §112, second paragraph rejections should be withdrawn. Such action is earnestly requested.

Claims 48-51, 55 and 68 were rejected under 35 U.S.C. §112, first paragraph, for the reasons set forth in paragraph (4) of the Office Action. Reconsideration of this rejection is requested for at least the following reasons.

As indicated above, the scope of the claims would be readily apparent to those of ordinary skill in this art. The invention resides in compositions containing at least one dimer having uretidinedione units and methods of preparing same. The claims, as amended, are believed to be specific in that regard and clearly enabled. Accordingly, the §112, first paragraph rejection of claims 48-51, 55 and 58 should be withdrawn.

Claims 39-76 were rejected under 35 U.S.C. §112, first paragraph, for the reasons given in paragraph (5) of the Office Action. Reconsideration of this rejection is requested for at least the following reasons.

Applicants respectfully submit that those of ordinary skill would readily be able to ascertain the scope and content of the present claims. Catalysts used to effect dimerization of isocyanates to produce compounds containing uretidinedione units are well-known in the art. Representative catalysts are discussed on page 3, lines 22-36 of the specification. Specific examples of dimerization catalysts to be excluded are set forth on page 6, lines 2-6 and page 19, lines 1-3. Likewise, catalysts used to effect trimerization of isocyanates to prepare compounds containing isocyanurate units or compounds containing biuret units are well-known to those skilled in this art. Note page 1, lines 14-29 and page 17, lines 3-26 of the specification.

Applicants note the statement in paragraph (5) of the Office Action indicating that the examples of dimerization catalysts to be excluded is not exhaustive. Respectfully, the list does not have to be exhaustive. The disclosure need only be sufficient to enable those of ordinary skill to understand and practice the invention. The disclosure need not teach what is well known in the art. M.P.E.P. §2164.01

For at least the above reasons, the rejection of claims 39-76 under 35 U.S.C. §112, first paragraph, should be withdrawn. Such action is earnestly solicited.

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From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned at (703) 838-6683 at his earliest convenience.

Respectfully submitted,

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Date: April 15, 2003

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Marked-up Claims 48-51, 60, 68 and 70

48. (Thrice Amended) A process for the preparation of a low-viscosity polyfunctional isocyanate composition containing (a) at least one [compound selected from the group consisting of an] isocyanate trimer containing an isocyanurate unit, or a compound containing a biuret unit [and] or mixtures thereof, and (b) at least one isocyanate dimer containing a uretidinedione unit, from starting isocyanate monomers, in which the isocyanate groups are borne by sp³ carbon atoms, and optionally from other monomers, this process comprising the following steps:

- i) heating the starting reaction medium, in the absence of dimerization catalyst, to a temperature of at least 80°C, and of not more than 200°C, for a period of less than 24 hours;
- ii) reacting the reaction product from step i) containing said isocyanate dimer and unreacted monomers with a [(cyclo)condensation] (cyclo)trimerization catalyst, under (cyclo)trimerization conditions;
- iii) removing [the] unreacted [starting] monomers from the reaction product from step ii); and
- iv) isolating the low-viscosity polyfunctional isocyanate composition [comprising at least one isocyanate trimer and/or biuret compound and at least one isocyanate dimer].

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Marked-up Claims 48-51, 60, 68 and 70

49. (Thrice Amended) A process for the preparation of a low-viscosity polyfunctional isocyanate composition containing (a) at least one [compound selected from the group consisting of an] isocyanate trimer containing an isocyanurate unit, or a compound containing a biuret unit [and] or mixtures thereof, and (b) at least one isocyanate dimer containing a uretidinedione unit, from starting isocyanate monomers, in which the isocyanate groups are borne by sp³ carbon atoms, and optionally from other monomers, this process comprising the following steps:

- i) heating the starting reaction medium, in the absence of dimerization catalyst, to a temperature of at least 120°C, and of not more than 170°C, for a period of less than 5 hours;
- ii) reacting the reaction product from step i) containing said isocyanate dimer and unreacted monomers with a [(cyclo)condensation] (cyclo)trimerization catalyst, under (cyclo)trimerization conditions;
- iii) removing [the] unreacted [starting] monomers from the reaction product from step ii); and
- iv) isolating the low-viscosity polyfunctional isocyanate composition [comprising at least one isocyanate trimer and/or biuret compound and at least one isocyanate dimer].

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Marked-up Claims 48-51, 60, 68 and 70

50. (Thrice Amended) A process for the preparation of a low-viscosity polyfunctional isocyanate composition containing (a) at least one [compound selected from the group consisting of an] isocyanate trimer containing an isocyanurate unit, or a compound containing a biuret unit [and] or mixtures thereof, and (b) at least one isocyanate dimer containing a uretidinedione unit, from starting isocyanate monomers in which the isocyanate groups are borne by sp³ carbon atoms, and optionally from other monomers, this process comprising the following steps:

- i) reacting the starting monomers with a (cyclo)trimerization [or (cyclo) condensation] catalyst under (cyclo)trimerization [or (cyclo)condensation] conditions;
- ii) heating the reaction product from step i) containing said isocyanate trimer and unreacted isocyanate monomers, in the absence of dimerization catalyst, to a temperature of at least 80°C, and of not more than 200°C, for a period of less than 24 hours;
- iii) removing [the] unreacted [starting] monomers from the reaction product from step ii); and
- iv) isolating the low-viscosity polyfunctional isocyanate composition [comprising at least one isocyanate trimer and/or biuret compound and at least one isocyanate dimer].

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Marked-up Claims 48-51, 60, 68 and 70

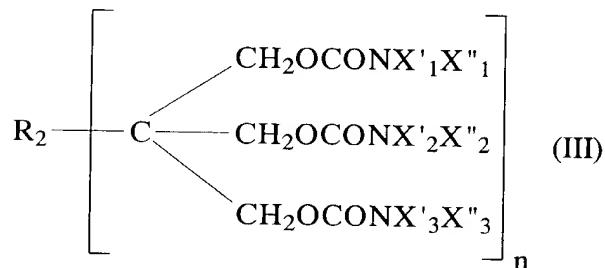
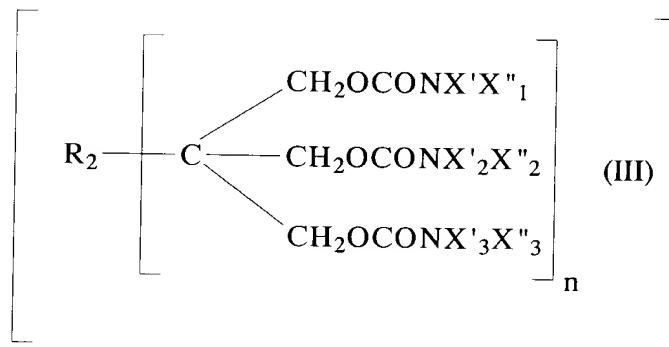
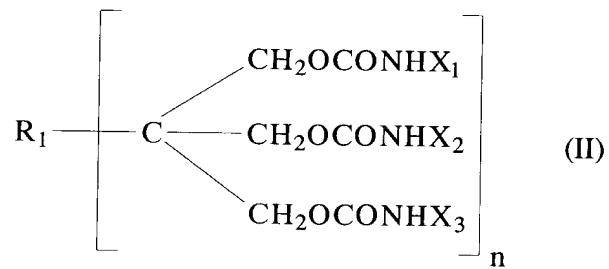
51. (Thrice Amended) A process for the preparation of a low-viscosity polyfunctional isocyanate composition containing (a) at least one [compound selected from the group consisting of an] isocyanate trimer containing an isocyanurate unit, or a compound containing a biuret unit [and] or mixtures thereof, and (b) at least one isocyanate dimer containing a uretidinedione unit, from starting isocyanate monomers in which the isocyanate groups are borne by sp³ carbon atoms, and optionally from other monomers, this process comprising the following steps:

- i) reacting the starting monomers with a (cyclo)trimerization [or (cyclo) condensation] catalyst under (cyclo)trimerization [or (cyclo)condensation] conditions;
- ii) heating the reaction product from step i) containing said isocyanate trimer and unreacted isocyanate monomers, in the absence of dimerization catalyst, to a temperature of at least 120°C, and of not more than 170°C, for a period of less than 5 hours;
- iii) removing [the] unreacted [starting] monomers from the reaction product from step ii); and
- iv) isolating the low-viscosity polyfunctional isocyanate composition [comprising at least one isocyanate trimer and/or biuret compound and at least one isocyanate dimer].

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Marked-up Claims 48-51, 60, 68 and 70

60. (Thrice Amended) A process according to claim 59, comprising adding to the reaction medium containing the starting monomers a compound of general formula II and/or III below:

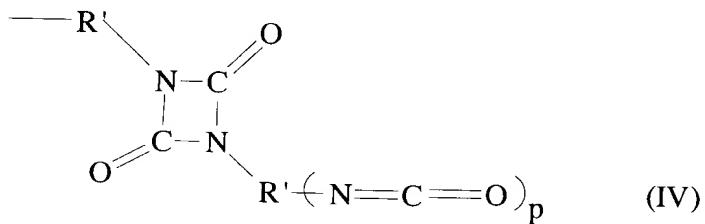


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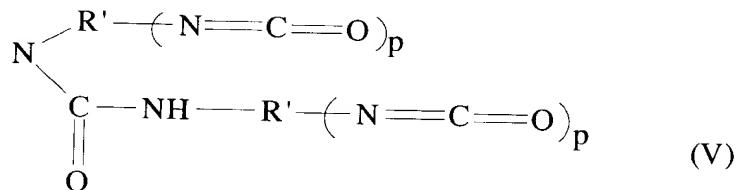
Marked-up Claims 48-51, 60, 68 and 70

in which

one or more of X_1 , X_2 and X_3 represents a group $R'-(N=C=O)_p$ in which R' is an aliphatic group and p is an integer ranging from 0 to 5, the others representing, a group of formula



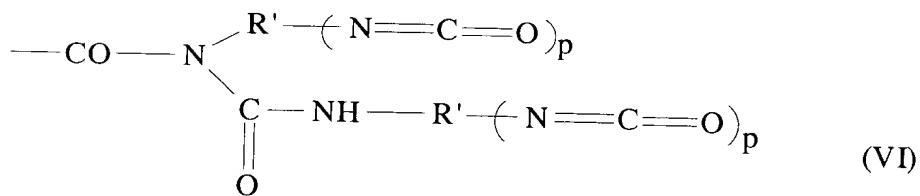
R_1 is a hydrocarbon group having 1 to 30 carbon atoms, in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally, bears 1 to 3 OH groups, with the OH groups optionally substituted, with a group $CONX_1H$, X_1 being as defined above, at least one of $NX'_1X''_1$, $NX'_2X''_2$ and $NX'_3X''_3$ represents the group,



the others representing a group NX_1H or NX_1 -silyl and R_2 being a hydrocarbon group having 1 to 30 carbon atoms, in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally, bears 1 to 3 OH groups, with the OH groups optionally substituted, with a group $CONX_1H$, or

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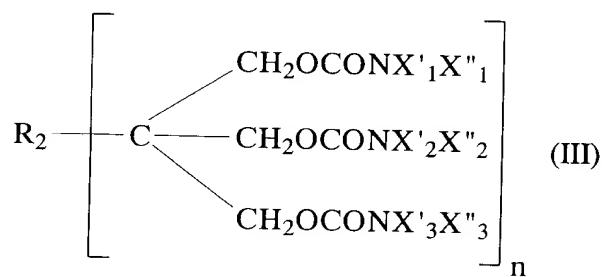
Marked-up Claims 48-51, 60, 68 and 70



and n is an integer ranging from 1 to 3.

68. (Amended) A composition according to Claim 67 comprising at least one compound of general formula X [and/or] and optionally, one compound of general formula VIII [and/or] or at least one compound of general formula XIII, or mixtures of compounds of formulae VIII and XIII, said composition being free of dimerization catalysts.

70. (Twice Amended) A compound [according to Claim 69] of the formula III

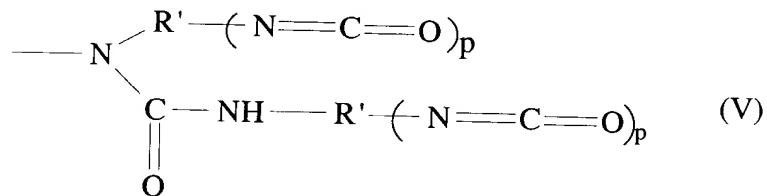


in which:

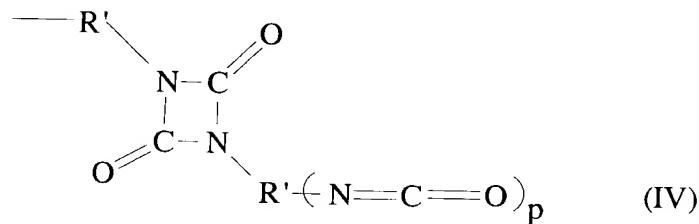
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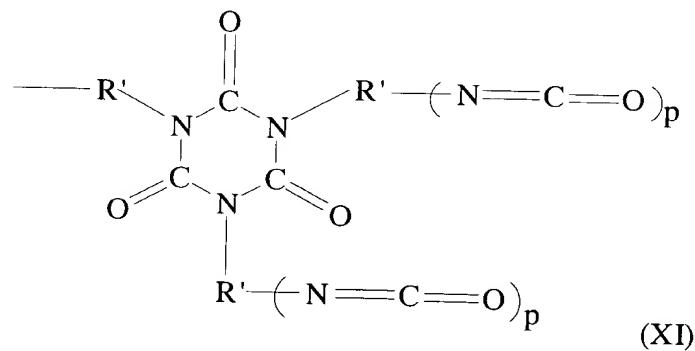
the groups $NX'_1X''_1$, $NX'_2X''_2$ and $NX'_3X''_3$ are selected from a group of general formula NX_1H , with X_1 representing a group $R'-(N=C=O)_p$ in which R' is an aliphatic group and p is an integer from 0 to 5, or a group of general formula V,



or a uretidinedione group of formula IV,



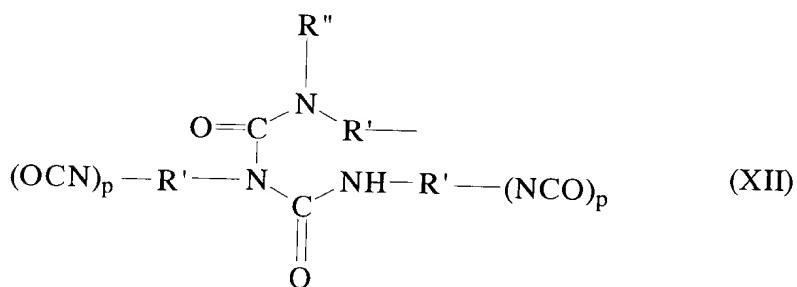
or an isocyanurate group of formula XI:



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[and] or, a biuret group of formula XII:



wherein R" represents H or a hydrocarbon group, R₂ being a hydrocarbon group having 1 to 30 carbon atoms in which the hydrocarbon chain optionally is interrupted by one or more chalcogen atoms and optionally bears 1 to 3 OH groups and n is an integer ranging from 1 to 3,

wherein the optional OH groups in R₂ are optionally substituted with a group selected from CONHX₁, a group of formula VI, a group of formula IV, a group of formula XI or a group of formula XII, with the proviso that the compounds containing at least one carbamate group of formula NX₁H, or CONHX₁H [respectively], [and/or] or allophanate group of formula V, or group of formula V [respectively], also contain at least one group selected from a uretidinedione group of general formula IV, [or] group of general formula IV, [respectively,] an isocyanurate group of general formula XI, [or] group of general formula XI [respectively, and], a biuret group of general formula XII, or group of general formula XII [respectively].